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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,508	06/23/2005	Tamotsu Sugimoto	062709-0149	6626

22428 7590 10/06/2008  
FOLEY AND LARDNER LLP  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER
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PRICE, CARL D

ART UNIT	PAPER NUMBER
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3749

MAIL DATE	DELIVERY MODE
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10/06/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/540,508	<b>Applicant(s)</b> SUGIMOTO ET AL.	
	<b>Examiner</b> Carl D. Price	<b>Art Unit</b> 3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/14/07;12/08/06;06/23/05</u> .                              | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### **Drawings**

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the drawing must show the following or the feature(s) canceled from the claim(s):

1) hydrogen ejecting orifice on the “upstream side” in the flowing direction of hydrogen gas flowing in a straight part of the hydrogen pipe body is formed to have a small diameter in comparison with the diameter of the hydrogen ejecting orifice on the downstream side in the flowing direction of hydrogen gas flowing in the straight part of the hydrogen pipe body (claim 6); and

2) wherein the hydrogen pipe body includes a curved portion, the hydrogen ejecting orifice on an outer circumferential side of the curved portion is formed to have a small diameter in comparison with the diameter of the hydrogen ejecting orifice on an inner circumferential side of the curved portion of the hydrogen pipe body (claim 7).

No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over **DE 41 15 814** in view of **EP 0 767 345** and **US 2692480 (Viaud et al)**.

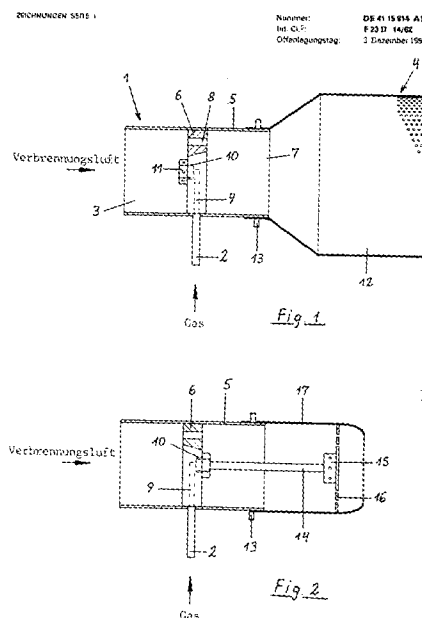
**EP 0 767 345** shows a hydrogen combustion device comprising:

- a casing defining a passage (3) for airflow therein;
- a gaseous fuel source (2; not shown) arranged outside the casing;
- a gaseous fuel source pipe (2, 9) arranged so as to extend from the gaseous fuel source, through the mixer and into the passage for airflow thereby to supply gas from the gaseous fuel source into the airflow flowing in the casing;
- the gas pipe having a gas pipe body and a gas ejecting part arranged at of the airflow to cause an oxidative reaction of the mixed gas thereby generating heat;
- wherein the gas ejecting part is positioned at a substantial center in the cross section of the passage defined in the casing and also arranged so as to extend along the flowing direction of the airflow, and
- a gas ejecting orifices (at 11) are arranged so that their axes extend in the radial direction of the hydrogen ejecting part, substantially perpendicularly to the flowing direction of the airflow;
- a mixer (6) arranged close to the gas pipe, for stirring the mixed gas; and
- a combustor (12) arranged on the downstream side of the mixer in the flowing direction.

shows and discloses the invention substantially as set forth in the claims with possible exception to:

- a hydrogen source as the fuel;
- a catalyst as the combustor;
- the leading end of the gas pipe body and also provided with a plurality of gas ejecting orifices.

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**DE 41 15 814** shows and discloses the invention substantially as set forth in the claims with possible exception to:

- a hydrogen source as the fuel;
- a catalyst as the combustor;
- the leading end of the gas pipe body having a tapered leading end and also provided with a plurality of gas ejecting orifices.

**EP 0 767 345** teaches, from applicant's same gas fuel mixer field of endeavor, that it is known to use a counter flow radial nozzle and mixer as a means to feed a hydrogen fuel gas mixture to a catalyst as the combustor.

**US 2692480 (Viaud et al)** teaches, from applicant's same gas fuel mixer field of endeavor, the leading end of the gas pipe body having a tapered leading end and also provided with a plurality of gas ejecting orifices.

In regard to claims 1-4, for the purpose of providing a desired fuel source and combustor, it would have been obvious to a person having ordinary skill in the art to modify **DE 41 15 814** to combust hydrogen fuel source in a catalytic combustor, in view of the teaching of **EP 0 767 345**. Also, in regard to claims 1-4, for the purpose of providing a suitable fuel distribution to assure complete mixing, it would have been obvious to a person having ordinary skill in the art

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to modify the counter flow nozzle and mixer of **DE 41 15 814** to include a tapered nozzle as claimed by applicant, in view of the teaching of **US 2692480 (Viaud et al)**.

In regard to claim 3, Official Notice is taken that welding is a well known means to securely joint fluid flow conduit sections in a fluid tight manner. Therefore, in view of that which is well known and for the known purpose, it would have been obvious to a person having ordinary skill in the art to secure the **DE 41 15 814** nozzle by welding.

**Claims 5-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **DE 41 15 814** in view of **EP 0 767 345** and **US 2692480 (Viaud et al)**, as applied to claim 1 above, and further in view of **US 4915619 (LaRue)** and **US 3989444**.

**DE 41 15 814** shows and discloses the invention substantially as set forth in the claims with possible exception to:

- wherein the hydrogen ejecting orifices have different diameters;
- a straight part of the hydrogen pipe body is formed to have a small diameter in comparison with the diameter of the hydrogen ejecting orifice on the downstream side in the flowing direction of hydrogen gas flowing in the straight part of the hydrogen pipe body;
- wherein the hydrogen pipe body includes a curved portion, the hydrogen ejecting orifice on an outer circumferential side of the curved portion is formed to have a small diameter in comparison with the diameter of the hydrogen ejecting orifice on an inner circumferential side of the curved portion of the hydrogen pipe body.

**US 4915619 (LaRue)** teaches, from applicant's same burner nozzle and gas mixing field of endeavor, radial flow openings in a gas mixing nozzle are advantageously formed to have different diameters (see col. 3, lines 9-14; Figure 1), for the purpose of aiding in reducing NO<sub>x</sub>.

**US 3989444** teaches, from applicant's same burner nozzle and gas mixing field of endeavor, radial flow openings in a gas mixing nozzle are advantageously formed to have different diameters (see col. 3, lines 9-14; Figure 1), for the purpose of promoting effective mixing.

In regard to claim 5-7, for the purpose of aiding in reducing NO<sub>x</sub> and/or for the purpose of promoting effective mixing, it would have been obvious to a person having ordinary skill in the art to modify the distribution and sizes of the plural nozzle openings of **DE 41 15 814** in the

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manner claimed by applicant, ejecting orifices to have different diameters, in view of the teaching of **US 4915619 (LaRue)** or **US 3989444**.

**Conclusion**

See the attached USPTO for, 892 for prior art made of record and not relied upon which is considered pertinent to applicant's disclosure.

**USPTO CUSTOMER CONTACT INFORMATION**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carl D. Price whose telephone number is (571) 272-4880. The examiner can normally be reached on Monday through Friday between 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B. McAllister can be reached on (571) 272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carl D. Price/

Primary Examiner, Art Unit 3749

Cp